

**TRACKING OPERATING SYSTEM PROCESS AND THREAD EXECUTION  
AND VIRTUAL MACHINE EXECUTION IN HARDWARE OR IN A VIRTUAL  
MACHINE MONITOR**

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**RELATED APPLICATIONS**

This application is related to U.S. Patent application serial number 09/541,444

titled REAL-TIME SCHEDULING OF VIRTUAL MACHINES, filed on March 31, 2000,

<sup>was</sup> <sup>STILL PENDING,</sup>  
and U.S. Patent application serial number 09/752,134 titled NEW PROCESSOR MODE

10 FOR LIMITING THE OPERATION OF GUEST SOFTWARE RUNNING ON A

VIRTUAL MACHINE SUPPORTED BY A VIRTUAL MACHINE MONITOR, filed on

<sup>STILL PENDING</sup>  
<sup>was</sup> December 27, 2000, both of which are assigned to the assignee of the present application.

**FIELD OF THE INVENTION**

15 This invention relates generally to virtual machine environments, and more particularly to scheduling virtual machines within those environments.

**BACKGROUND OF THE INVENTION**

20 An Operating System (OS) is a software program that controls physical computer hardware (e.g., a processor, memory, and disk and CD-ROM drives) and presents application programs with a unified set of abstract services (e.g., a file system). Modern OSs typically multi-task among several application programs, each of which executes in a separate process, and many enable application programs to multi-task among several "threads" that share the same process address space.

25 Modern processors frequently have "performance counters," software-configurable registers that count occurrences of various performance "events." Typical events include